

Jam Huyer

SITE INFORMATION										
	Rep	ort Type:	Closure Re	port	1 RP 3439					
General Site Info	-			-						
Site:		Dos Abuelos	Fee #1H							
Company:		COG Operati	ing LLC							
Section, Townsh	hip and Range		Sec. 20	T 18S	R 34E					
Lease Number:		API No. 30-02	25-41346							
County:		Lea County								
GPS:			32.74061º N		103.58406º W					
Surface Owner:		Federal								
Mineral Owner:										
Directions:					529 travel northwest on HWY 529 for approximatel 25 feet, turn southeast onto lease rd for 0.8 mi to th					
Dalasas Datas										
Release Data:										
Date Released:		11/14/2014								
Type Release:		Oil								
Source of Contan	nination:	Failed dump	valve							
Fluid Released:		100 bbls								
Fluids Recovered: 70 bbls										
Official Communication:										
Name:	Robert McNeil				Ike Tavarez					
Company:	COG Operating, LL	c			Tetra Tech					
Address:	One Concho Cente									
Auuress.		1			4000 N. Big Spring					
	600 W. Illinois Ave.				Ste 401					
City:	Midland Texas, 797	01			Midland, Texas					
Phone number:	(432) 686-3023				(432) 682-4559					
Fax:	(432) 684-7137									
Email:	rmcneil@conchor	esources.com			Ike.Tavarez@tetratech.com					
Ranking Criteria			Ranking Score		Site Data					
<50 ft			20							
50-99 ft			10		0					
>100 ft.			0		0					
WellHead Protecti	on:		Ranking Score		Site Data					
	000 ft., Private <200 ft	4	20		CAO Buin					
	000 ft., Private >200 ft		0		0					
Surface Body of V	Vater:		Ranking Score		Site Data					
Surface Body of Water: <200 ft.			20		CAO DUM					
200 ft - 1,000 ft.			10							
>1,000 ft.			0		0					
Tot	al Ranking Score	,	0							
		Accepta	ble Soil RRAL (r	ng/kg)						
		Benzene	Total BTEX	TPH						
		10	50	5,000						
					_					



August 29, 2015

Mr. Jamie Keyes Environmental Engineer Specialist Oil Conservation Division, District 1 1625 North French Drive Hobbs, New Mexico 88240

# Re: Closure Report for the COG Operating LLC., Dos Abuelos Fee #1H, Unit C, Section 20, Township 18 South, Range 34 East, Lea County, New Mexico. 1RP 3439

# Mr. Keyes:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess a spill from the Dos Abuelos Fee #1H, Unit C, Section 20, Township 18 South, Range 34 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.74061°, W 103.584065°. The site location is shown on Figures 1 and 2.

## Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on November 14, 2014, and released approximately one hundred (100) bbls of oil due to a failed dump valve. Approximately seventy (70) bbls of oil were recovered. The initial C-141 is included in Appendix A.

# Groundwater

According to the New Mexico Office of the State Engineer, there are six (6) water wells listed in Section 20. The depth to water in these wells ranged from 80-130' below ground surface, with an average depth to groundwater of 109'. According to the NMOCD groundwater map, the average depth to groundwater in this area is between 100' to 125' below surface. The groundwater data is shown in Appendix B.

# Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels



(RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

# **Soil Assessment and Analytical Results**

# COG Sampling and Remediation

COG personnel supervised the initial sampling event. Five (5) sample points (S-1 through S-5) were installed in the middle of the spill path to evaluate the vertical extents of the impact. Additionally, five sample points (S-1 (2) through S-5(2)) were installed on the edges of the release to evaluate the horizontal extents of the release. According to type of release, the spill area was evaluated for TPH and BTEX and no loss of produce water. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. The laboratory results, provided by COG personnel, are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, the areas of S-1 and S-2 showed total TPH and BTEX concentrations above the RRAL's, with TPH concentrations of 16,410 mg/kg and 20,120 mg/kg at 4" and total BTEX concentrations of 181 mg/kg and 348 mg/kg at 4" below surface, respectively. Additionally, the area of S-3 showed a total TPH concentration of 7,785 mg/kg at 4" below surface. All of the remaining areas showed TPH and BTEX concentrations below the RRAL's. Based on the results, COG treated the surface soil with a Micro-Blaze product.

## Tetra Tech Sampling and Results

Based on the laboratory data, Tetra Tech personnel were onsite on August 16, 2016, to supervise the trench sampling of S-1, S-2 and S-3 in order to vertically define the extents of the hydrocarbon impact. The areas were sampled at 0-4" and 4"-12" below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 2. The sample locations are shown on Figure 3.

Referring to Table 2, none of the samples collected showed TPH or BTEX concentrations above the RRAL's. Additionally, the chloride concentrations were below laboratory reporting limits and a chloride high of 96 mg/kg at S-3 at 4-12" below surface.



# Conclusion

Based on the laboratory results, COG requests closure of this spill issue. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted, TETRA TECH

4 TS

Ike Tavarez, PG Senior Geologist

Clair Clongalos

Clair Gonzales, Geologist

cc:

Robert McNeill – COG Dakota Neel – COG

# Figures



Mapped By: Isabel Marmolejo



Mapped By: Isabel Marmolejo



# Tables

# Table 1 COG Operating LLC. Dos Abuelos #2H Lea County, New Mexico

Sample	Sample Depth	Soil S	Status		TPH (mg/k	g)	<b>Total BTEX</b>
ID	(in)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)
S-1	4	Х		2,210	14,200	16,410	181
S-2	4	Х		3,220	16,900	20,120	348
S-3	4	Х		375	7,410	7,785	12.0
S-4	4	Х		<10.0	967	967	<0.300
S-5	4	Х		<10.0	237	237	<0.300
S-1 (2)	16	Х		13.6	140	154	<0.300
	18	Х		15.7	1,440	1,456	<0.300
S-2 (2)	16	Х		<50.0	1,830	1,830	<0.300
	20	Х		<10.0	346	346	<0.300
S-3 (2)	15	Х		<10.0	220	220	<0.300
	26	Х		<10.0	254	254	<0.300
S-4 (2)	17	Х		<10.0	75.00	75.0	<0.300
S-5 (2)	19	Х		<10.0	21.40	21.40	<0.300
	20	Х		<10.0	<10.0	<10.0	<0.300

(-)

Samples collected by COG

# Table 2 COG Operating LLC. Dos Abuelos #2H Lea County, New Mexico

Sample	Sample	Sample	Soil	Status	1	PH (mg/k	g)	Benzene	Toluene	Ethlybenzene	Xylene	Total	Chloride
ID	Date	Depth (in)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	BTEX (mg/kg)	(ma/ka)
S-1	8/16/2016	0-4	Х		<10.0	<10.0	<10.0	0.061	0.322	0.054	0.199	0.635	<16.0
	=	4-12	Х		-	-	-	-	-	-	-	-	<16.0
						1			1			r	
S-2	8/16/2016	0-4	Х		<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	<16.0
	H	4-12	Х		-	-	-	-	-	-	-	-	16.0
							1	1	1		1	1	1
S-3	8/16/2016	0-4	Х		<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	<16.0
	"	4-12	Х		-	-	-	-	-	-	-	-	96.0

(-) Not Analyzed

# Appendix A

4. 16

# State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised August 8, 2011

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

1220 S. St. Fra	ncis Dr., Sant	a Fe, NM 87505		Sa	nta Fe	, NM 875	05			
			Rele	ase Notific	atior	and Co	orrective A	ction		
						OPERA'	FOR	🛛 Initia	l Report	Final Report
		COG Operati					bert McNeill			
		inois Avenue		d TX 79701		A	lo. 432-230-00	77		
Facility Na	me: Dos A	buelos Fee #	1 <b>H</b>			Facility Typ	e: Battery			
Surface Ov	vner: Fee			Mineral O	wner: l	Fee		API No.	30-025-41	346
				LOCA	TIO	N OF REI	LEASE	·		
Unit Letter	Section	Township	Range	Feet from the		/South Line	Feet from the	East/West Line		County
С	20	18S	34E	190'	]	North	2310	West		-Eddy /Lag
			Latit	ude 32,7399552	218009	9 Longitud	e -103.5836541	22109		
				NAT	URE	OF REL	EASE			
Type of Rele	case:					Volume of	Release:	Volume R	ecovered:	
Oil Source of Re	learet					100 bbls	lour of Occurrenc	70 bbls	lour of Disc	
		ed a release thi	ough the f	lare			lour of Occurrenc		1001 OF DISC 4 10:00 am	overy;
Was Immedi			ougnation	100		If YES, To		11/14/201	+ 10.00 Mil	
		$\boxtimes$	Yes 📋	No 🔲 Not Re	quired		erding - NMOCD	Hobbs		
By Whom?	Amanda	Truiillo				Date and H	iour:11/14/2014 2	2:01 pm		
Was a Water							lume Impacting 1			
			Yes 🛛	No			• –			
This release	was caused high level	float failed to	ction dum	p on oil side of FV				n. The knockout fill ce. Vacuum trucks		
Describe Are	ea Affected	and Cleanup A	ction Tak	en.•						
The impacte	d area can b	e found to the	north of th	te battery in the pa				sampled to delineat ignificant remediation		le contamination
regulations a public health should their or the enviro	all operators or the envi operations h onment. In a	are required to ronment. The nave failed to a	o report an acceptanc dequately (CD accep	d/or file certain re e of a C-141 repo- investigate and re	lease no rt by the mediate	otifications as NMOCD m c contaminati	nd perform correct arked as "Final R on that pose a thr	nderstand that purst tive actions for rele eport" does not relic eat to ground water, responsibility for co	ases which r eve the operation of the surface wat	nay endanger ator of liability er, human health
Signature:	4	6-7.0	<i>ان خ</i>	la			<u>OIL CON</u>	SERVATION	DIVISIO	N
Printed Nam	ic: Amanda	Trujillo				Approved by	Environmental S	pecialist:		
Title: Senior	Environme	ntal Coordinat	or			Approval Dat	ie:	Expiration I	Date:	
		oa concho.con				Conditions of			Attached	
Date: December 1, 2014 Phone: 575-748-6940										

\* Attach Additional Sheets If Necessary

# State of New Mexico **Energy Minerals and Natural Resources**

**Oil Conservation Division** 1220 South St. Francis Dr. Santa Fe, NM 87505

Form C-141 Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

# **Release Notification and Corrective Action**

	OPERATOR	Initial Report	Final Report
Name of Company COG Operating LLC	Contact Robert McNeil		
Address 600 West Illinois Ave., Midland, TX 79701	Telephone No. (432) 683-7443		
Facility Name Dos Abuelos Fee #1H	Facility Type <b>Battery</b>		

Surface Owner: Federal	Mineral Owner	API No. 30-025-41346

# LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County	
С	20	18S	34E						Lea

Latitude N 32.74061° Longitude W 103.58406°

#### NATURE OF RELEASE Type of Release: Oil Volume of Release 100 bbls Volume Recovered 70 bbls Source of Release: Failed dump valve caused a release through the flare Date and Hour of Occurrence Date and Hour of Discovery 11/14/14 12:00 am 11/14/14 10:00 am Was Immediate Notice Given? If YES, To Whom? Yes No Not Required **Tomas Oberding - NMOCD** Date and Hour 11/14/14 2:01pm By Whom? Amanda Trujillo Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. 🗌 Yes 🖾 No N/A If a Watercourse was Impacted, Describe Fully.\* N/A Describe Cause of Problem and Remedial Action Taken.\* This release was caused when a snap action dump on oil side of a FWKO froze, not allowing the dump to open. The knockout filed with fluid and overflowed to the flare. The high level float failed to activate the inlet valve to shut it off so the well continued to produce. Vacuum trucks and a roustabout crew were dispatched to remove all standing fluids. Describe Area Affected and Cleanup Action Taken.\* Tetra Tech inspected site and collected samples to define spills extent. None of the samples collected showed impact above the RRAL's. Tetra Tech prepared closure report and submitted to NMOCD for review. I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. OIL CONSERVATION DIVISION Signature: Approved by District Supervisor: Printed Name: Ike Tavarez (Agent for COG) **Expiration Date:** Title: Project Manager Approval Date: E-mail Address: Ike.Tavarez@TetraTech.com Conditions of Approval: Attached

Date: 08/25/16 Phone: (432) 682-4559 \* Attach Additional Sheets If Necessary

Appendix B

# Water Well Data Average Depth to Groundwater (ft) COG - Dos Abuelos Fee #1H, Lea County, New Mexico

		17	So	outh	33 East					
6	90	5		4	3	155	2	158	1	150
7	167	8 173		9 <b>161</b>	10		11		12	
18 <mark>188</mark>	3	17 <b>180</b>		16	15		14		13 165	5
19		20 <b>190</b>		21	22		23 11	5	24	
30	69	29	60	28	27		26		25	
31		32		33 <b>120</b>	34		35 155	5	36	

31	32	33	34	35	36
		120		155	
	18 So	outh	;	33 East	
6	5	4	3	2	1
			60		
7	8 <b>100</b>	9	10	11	12 <b>143</b>
			62	46	140
18	17	16	15	14	13
	85			36	60
19	20	21	22	23	24
>140					195
30	29	28	27	26	25
35					
31	32	33	34	35	36
	1	1	1	1	

	19 Sc	outh	33		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
340	116				
19	20	21	22	23	24
30	29	28 130	27	26 <mark>92</mark>	25
		dry		85	
31	32	33	34	35	36
	185				

	17 So	outh	34	East	
6 <b>120</b>	5	4	3	2 <b>80</b>	1
157		65	95		77
7	8	9	10	11	12
140	1 <b>40</b>		95	92	115
18	17	16	15 <b>114</b>	14	13
160	113	60	60	79	84
19	20	21	22	23	24
78	1 <b>40</b>	153	109		
30	29	28	27	26	25
					82
31	32	33	34	35	36

	18 So	outh	34	East	
6	5	4	3	2	1
130	105		87	102	107
7	8	9	10	11	12 <b>115</b>
83	148		148	110	92
18	17	16	15 <b>114</b>	14	13
125		108	110	103	96
19	20	21	22	23	24
105	125				
30	29	28	27	26	25
			112		117
31	32	33	34	35	36
				118	

	19 \$	South	;	34 East	
6	5	4	3	2 <b>10</b>	0 1
244					
7	8	9 <b>29</b>	10	11	12 <mark>60</mark>
		28.6		123	
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
					28
31	32	33	34	35	36
65					

	17 Sc	outh	35	East	
6	5	4	3	2	1
					50
7	8	9	10	11	12
18	17	16	15	14	13
40	55				
19	20	21	22	23	24
85	60				
30	29	28	27	26	25
83		70			
31	32	33	34	35	36
106		63	56	40	50

	18 Sc	outh			35	East	
6 <mark>89</mark>	5 <b>69</b>	4	58	3	62	2 <b>55</b>	1
						51	
7	8	9	72	10		11 <b>59</b>	12
85				49		48	
18	17 <b>90</b>	16		15		14	13
90	124	75				90	135
19 <b>74</b>	20 <b>85</b>	21		22		23	24
70	50			70			
30	29	28		27		26	25
	95			68		60	
31	32	33		34		35	36
	58	80				58	

	19 So	outh	35	East	
6 <mark>61</mark>	5	4	3	2	1
58	63	70			63
7	8	9 <b>20</b>	10	11	12
51	18		53		
18	17 <mark>26</mark>	16	15	14	13
	30		26	27	27
19	20	21	22	23	24
			27		20
30	29	28	27	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6) Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

**121** Abandoned Waterwell (recently measured)



# New Mexico Office of the State Engineer Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a	(R=POD has been replaced O=orphaned, C=the file is	(qua					NE 3=SW	,	2 LITM in motors)		(In foot	• \
water right file.)	closed) POD Sub-	(qua				nest to	argest)	(NADo	3 UTM in meters)		(In feel	Water
POD Number	Code basin (	Count				c Tws	Rng	х	Y	•	•	Column
L 09752	L	LE			2 20			632968	3623188 🌍	179	130	49
L 10345 POD2	L	LE		23	3 20	18S	34E	632620	3622393* 🔵	130	120	10
<u>L 10346</u>	L	LE		3	3 20	18S	34E	632425	3622187* 😜	130		
<u>L 10436</u>	L	LE		3	3 20	18S	34E	632425	3622187* 🌍	120	80	40
L 13526 POD1	L	LE	2	2 1	1 20	18S	34E	632769	3623271 🌍	196	106	90
L 13563 POD1	L	LE	4	4 4	1 20	18S	34E	633506	3621920 🌍	200		
									Average Depth to	Water:	109 f	eet
									Minimum	n Depth:	80 f	eet
									Maximum	Depth:	130 f	eet
Record Count: 6												
PLSS Search:												

Section(s): 20

Township: 18S

Range: 34E

\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

Appendix C



August 23, 2016

DAKOTA NEEL

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: DOS ABUELOS #2H

Enclosed are the results of analyses for samples received by the laboratory on 08/16/16 16:45.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at <a href="https://www.tceq.texas.gov/field/ga/lab\_accred\_certif.html">www.tceq.texas.gov/field/ga/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5
Method EPA 524.2	Total Trihalomethanes (TTHM
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Whe Sigh

Mike Snyder For Celey D. Keene Lab Director/Quality Manager



ARTESIA NM, 88210 Project Manager: DAKOTA NEEL Fax To: NONE
--

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1 (0-4")	H601835-01	Soil	16-Aug-16 00:00	16-Aug-16 16:45
S-1 (4"-1')	H601835-02	Soil	16-Aug-16 00:00	16-Aug-16 16:45
S-2 (0-4")	H601835-03	Soil	16-Aug-16 00:00	16-Aug-16 16:45
S-2 (4"-1')	H601835-04	Soil	16-Aug-16 00:00	16-Aug-16 16:45
S-3 (0-4")	H601835-05	Soil	16-Aug-16 00:00	16-Aug-16 16:45
S-3 (4"-1')	H601835-06	Soil	16-Aug-16 00:00	16-Aug-16 16:45
. ,			5	5

#### **Cardinal Laboratories**

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence ar any other cause whitstoewer shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether su claim is based to reprodued except in full with written approval of Cardinal Lobarotories.

Mite Sugh



COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210	Project Num Project Mana	ber: NON	OTA NEEL	2	Reported: 23-Aug-16 11:58					
				1 (0-4'') 335-01 (So	oil)					
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardina	l Laborat	ories					
Inorganic Compounds										
Chloride	<16.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	
Volatile Organic Compounds by	EPA Method	8021								
Benzene*	0.061		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Toluene*	0.322		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Ethylbenzene*	0.054		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total Xylenes*	0.199		0.150	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total BTEX	0.635		0.300	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			106 %	73.6-	-140	6081802	MS	18-Aug-16	8021B	
Petroleum Hydrocarbons by GC	C FID									
GRO C6-C10	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
DRO >C10-C28	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctane			87.2 %	35-	147	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctadecane			99.3 %	28	171	6081702	MS	17-Aug-16	8015B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210			Project Num Project Mana	ber: NC	KOTA NEEL			2	Reported: 3-Aug-16 11:	58
S-1 (4''-1') H601835-02 (Soil)										
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
	Cardinal Laboratories									
Inorganic Compounds										
Chloride	<16.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210	Project Num Project Mana Fax S	ber: NOI ager: DAk To: NOI 2 (0-4'')	KOTĂ NEEL NE			2	Reported: 23-Aug-16 11:	58		
			H6018	835-03 (So	oil)					
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardina	l Laborat	ories					
Inorganic Compounds										
Chloride	<16.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	
Volatile Organic Compounds by	EPA Method	8021								
Benzene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Toluene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Ethylbenzene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total Xylenes*	< 0.150		0.150	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total BTEX	< 0.300		0.300	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			109 %	73.6	-140	6081802	MS	18-Aug-16	8021B	
Petroleum Hydrocarbons by GC	FID									
GRO C6-C10	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
DRO >C10-C28	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctane			69.5 %	35-	147	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctadecane			79.7 %	28-	171	6081702	MS	17-Aug-16	8015B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210			Project Num Project Mana	ber: NC	AKOTA NEEL			2	Reported: 3-Aug-16 11:	58
				2 (4''-1 835-04 (\$	·					
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardina	l Labor:	atories					
Inorganic Compounds										
Chloride	16.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210			Project Num Project Mana Fax S	ber: NOI ager: DAk To: NOI 3 (0-4'')	KOTĂ NEEL NE			2	Reported: 23-Aug-16 11:5	58
			H6018	835-05 (So	oil)					
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardina	l Laborat	ories					
Inorganic Compounds										
Chloride	<16.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	
Volatile Organic Compounds by	EPA Method	8021								
Benzene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Toluene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Ethylbenzene*	< 0.050		0.050	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total Xylenes*	< 0.150		0.150	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Total BTEX	< 0.300		0.300	mg/kg	50	6081802	MS	18-Aug-16	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			106 %	73.6	-140	6081802	MS	18-Aug-16	8021B	
Petroleum Hydrocarbons by GC	C FID									
GRO C6-C10	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
DRO >C10-C28	<10.0		10.0	mg/kg	1	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctane			96.7 %	35-	147	6081702	MS	17-Aug-16	8015B	
Surrogate: 1-Chlorooctadecane			105 %	28-	171	6081702	MS	17-Aug-16	8015B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210			Project Nun Project Mana	nber: NC	KOTA NEEL			2	Reported: 3-Aug-16 11:	58
				3 (4''-1' 835-06 (S						
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardina	al Labora	tories					
Inorganic Compounds										
Chloride	96.0		16.0	mg/kg	4	6081707	AC	19-Aug-16	4500-Cl-B	

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210	Project:DOS ABUELOS #2HReportProject Number:NONE GIVEN23-Aug-1Project Manager:DAKOTA NEELFax To:NONE												
	Ino	rganic Com Cardir	-	- Quality oratories	Control								
		Reporting		Spike	Source		%REC		RPD				
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes			
Batch 6081707 - 1:4 DI Water													
Blank (6081707-BLK1)				Prepared: 1	7-Aug-16	Analyzed: 1	8-Aug-16						
Chloride	ND	16.0	mg/kg										
LCS (6081707-BS1)				Prepared: 1	7-Aug-16	Analyzed: 1	8-Aug-16						
Chloride	432	16.0	mg/kg	400		108	80-120						
LCS Dup (6081707-BSD1)				Prepared: 1	7-Aug-16	Analyzed: 1	8-Aug-16						
Chloride	448	16.0	mg/kg	400		112	80-120	3.64	20				

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210	Project: Project Number: Project Manager: Fax To:	DAKOTA NEEL	Reported: 23-Aug-16 11:58
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#### Volatile Organic Compounds by EPA Method 8021 - Quality Control

# **Cardinal Laboratories**

Γ										
		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 6081802 - Volatiles										
Blank (6081802-BLK1)				Prepared &	Analyzed:	18-Aug-1	6			
Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0536		mg/kg	0.0500		107	73.6-140			
LCS (6081802-BS1)				Prepared &	Analyzed:	18-Aug-1	6			
Benzene	2.30	0.050	mg/kg	2.00		115	82.6-122			
Toluene	2.35	0.050	mg/kg	2.00		117	72.9-122			
Ethylbenzene	2.25	0.050	mg/kg	2.00		113	65.4-131			
Total Xylenes	6.81	0.150	mg/kg	6.00		113	73.8-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.0535		mg/kg	0.0500		107	73.6-140			
LCS Dup (6081802-BSD1)				Prepared &	Analyzed:	18-Aug-1	6			
Benzene	2.34	0.050	mg/kg	2.00		117	82.6-122	1.39	8.23	
Toluene	2.38	0.050	mg/kg	2.00		119	72.9-122	1.25	8.71	
Ethylbenzene	2.29	0.050	mg/kg	2.00		115	65.4-131	1.81	9.46	
Total Xylenes	6.94	0.150	mg/kg	6.00		116	73.8-125	1.86	8.66	
Surrogate: 4-Bromofluorobenzene (PID)	0.0530		mg/kg	0.0500		106	73.6-140			

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COG OPERATING P. O. BOX 1630 ARTESIA NM, 88210	Project: Project Number: Project Manager: Fax To:	DAKOTA NEEL	Reported: 23-Aug-16 11:58
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# Petroleum Hydrocarbons by GC FID - Quality Control

### **Cardinal Laboratories**

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 6081702 - General Prep - Organics										
Blank (6081702-BLK1)				Prepared &	Analyzed:	17-Aug-1	6			
GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	47.6		mg/kg	50.0		95.1	35-147			
Surrogate: 1-Chlorooctadecane	52.0		mg/kg	50.0		104	28-171			
LCS (6081702-BS1)				Prepared &	Analyzed:	17-Aug-1	6			
GRO C6-C10	189	10.0	mg/kg	200		94.3	76.7-115			
DRO >C10-C28	198	10.0	mg/kg	200		98.9	78.3-122			
Total TPH C6-C28	386	10.0	mg/kg	400		96.6	79.8-117			
Surrogate: 1-Chlorooctane	49.3		mg/kg	50.0		98.6	35-147			
Surrogate: 1-Chlorooctadecane	52.8		mg/kg	50.0		106	28-171			
LCS Dup (6081702-BSD1)				Prepared &	Analyzed:	17-Aug-1	6			
GRO C6-C10	204	10.0	mg/kg	200		102	76.7-115	7.74	9.42	
DRO >C10-C28	212	10.0	mg/kg	200		106	78.3-122	7.06	13.2	
Total TPH C6-C28	416	10.0	mg/kg	400		104	79.8-117	7.39	10.7	
Surrogate: 1-Chlorooctane	51.7		mg/kg	50.0		103	35-147			
Surrogate: 1-Chlorooctadecane	56.1		mg/kg	50.0		112	28-171			

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### **Notes and Definitions**

- ND
   Analyte NOT DETECTED at or above the reporting limit

   RPD
   Relative Percent Difference

   \*\*
   Samples not received at proper temperature of 6°C or below.

   \*\*\*
   Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
   Samples reported on an as received basis (wet) unless otherwise noted on report

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